



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/707,922	01/26/2004	Carles Borrego Bel	8136ES	1921
23688	7590	11/15/2006	EXAMINER	
Bruce E. Harang PO BOX 872735 VANCOUVER, WA 98687-2735			PARRIES, DRU M	
			ART UNIT	PAPER NUMBER
			2836	

DATE MAILED: 11/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/707,922

Applicant(s)

BORREGO BEL ET AL.

Examiner

Dru M. Parries

Art Unit

2836

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 27 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION*****Response to Arguments***

1. Applicant's arguments filed August 27, 2006 have been fully considered but they are not persuasive. Gronbach does teach a bi-directional DC/DC converter (22) (last sentence of [0010], and see arrows in Fig. 1 above 22) that connects the higher voltage network (18) with the lower voltage network (28) to help maintain both voltage level systems in the vehicle (middle of [0010]). He goes on to teach that during normal operation switch (31) is closed and (32) is open and converter (20) steps down voltage from the 42V side and supplies it to the 14V side "to support the 14V voltage level via the 42V side" (middle of [0010]). He also teaches that converters (20, 22) could be combined into one converter having the properties and duties of both ([0016]). Therefore, Gronbach teaches a power system in a vehicle with two voltage levels powering two different sets of loads (16, 26) having a bi-directional converter (22 (and 20)) between the different levels for supplying power to "support" each of the levels via the other level (i.e. help power loads). The only difference between Gronbach and the original claim 1 is a plurality of DC/DC converters corresponding to their own set of loads, since Gronbach already teaches a two voltage level system, with a bi-directional DC/DC converter between them, and using the converter to help supply power to loads on either side when instructed by a control unit.

Next, Maeda teaches a vehicle power system comprising sets of loads having a corresponding DC/DC converter matched with each set of loads. All of the sets of loads contain some 14V loads and some 42V loads, but all connected with their designated converter. Also, each load contains a fuse for protection. Now modifying the Gronbach invention with this

Art Unit: 2836

invention, one would come up with the Gronbach system having a plurality of DC/DC converters all around the vehicle, some taking 42V power from the one side (18) and converting it to the corresponding 14V loads when necessary and vice versa. An advantage to having a plurality of DC/DC converters instead of one, is that it would require less wiring from the converter to the load (Col. 5, lines 37-42 of Maeda). One would put the plurality of loads into groups based on the location of the loads throughout the vehicle and, that too, would allow for less wiring.

2. Applicant's arguments with respect to the new limitations of a high speed communication bus and the switches being FETs have been fully considered and are persuasive. However, a new ground(s) of rejection is made in view of Mahvi and Beihoff, respectively.

3. Regarding the Applicant's argument that the prior art references fail to provide the necessary impetus to combine the references, all of the prior art references are in the same field of endeavor (i.e. vehicle power supply system) and/or solve a particular problem with which the applicant was concerned (i.e. the type of switch used).

4. Regarding the rest of the Applicant's arguments, they are moot, since they aren't positively recited in the claims (i.e. providing protection during transient changes to the load; the fuses being located downstream from the converter).

5. Applicant's arguments with respect to the claim and specification objections have been fully considered and are persuasive. The objections to the specification and claims 1, 2, 5, 6, 8, and 10 have been withdrawn.

#### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2836

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 3, 4, 7, 8, 10, 12, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gronbach (2003/0155814), Maeda (6,340,848), and Mahvi (2003/0036823). Gronbach teaches a vehicle with two networks at different voltage levels (42V and 14V), where each network can feed the other via a bi-directional DC-DC converter (22). He also teaches several equal shunted DC/DC converters (20, 22) connecting the first and second networks connected to a common point. Both networks are fed via a battery (12 and 24) and one is connected to a generator (10). He also teaches loads not being able to be fully supported via one source, so converters, and the other network battery, help to provide support to the one network by supplying the extra power needed to supply to the loads ([0010]). He also teaches a control unit which controls the converters output to each load (last of [0012]). Gronbach fails to teach having each converter having its own set of loads nor does he teach protection means in some of the loads of each set. Maeda teaches a power distribution system in a vehicle comprising sets of 14V loads (normal load) and 42V loads (large capacity load) in different parts of the vehicle each connected to a distribution box containing a DC/DC converter corresponding to each set of loads. He also teaches fuses (31f, 31d, 33f, 33d, 35d, 35f) protecting the all loads in each set (Fig. 2). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate a plurality of DC/DC converters assigned to particular sets of loads to minimize the amount of wires running through the system (Maeda—Col. 5, lines 34-42) and to have more accuracy with different sets of loads. It also would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate fuses into the load side of the

Art Unit: 2836

converters to protect the loads from overcurrent or overvoltage. Gronbach also fails to explicitly teach how the control unit communicates with the converters and the rest of the supply system.

Mahvi teaches a vehicle control system using a high speed communications bus, for example, the CAN standard ([0032]). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a CAN high speed communication bus since they are known to be used in the vehicles art and Gronbach was silent on this issue.

8. Claims 2, 9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gronbach (2003/0155814), Maeda (6,340,848), and Mahvi (2003/0036823) as applied to claims 1 and 10 above, and further in view of Nonaka (JP 08-111932 A). Gronbach, Maeda, and Mahvi teach a vehicle power distribution system as described above. Gronbach teaches a controller that controls the output of the converters (last of [0012]). Maeda teaches each set of 42V loads each being associated with a DC/DC converter. Gronbach fails to explicitly teach detecting the current required by the loads. Nonaka teaches detecting the power requirement of a load. It would have been obvious to one of ordinary skill in the art at the time of the invention to, via some point in the circuit, detect the current required by each load, so that Gronbach's controller will know what voltage to output from the converters to properly feed the loads.

9. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gronbach (2003/0155814), Maeda (6,340,848), and Mahvi (2003/0036823) as applied to claim 1 above, and further in view of Tamai et al. (2002/0190690). Gronbach, Maeda and Mahvi teach a vehicle power distribution system as described above. They fail to teach the use of fuses and switches as protecting means for the loads. Tamai teaches the use of both fuses and controlled switches (22-25) as protection means (Fig. 1). It would have been obvious to one of ordinary



Art Unit: 2836

skill in the art at the time of the invention to implement fuses and switches into some of the load circuits to include extra protection against overcurrent and overvoltage.

10. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gronbach (2003/0155814), Maeda (6,340,848), Mahvi (2003/0036823), and Tamai et al. (2002/0190690) as applied to claims 1, 5, and 6 above, and further in view of Beihoff et al. (2003/0132042). Gronbach, Maeda, Mahvi, and Tamai teach a vehicle power distribution system as described above. They fail to explicitly teach the type of switches used as protection means. Beihoff teaches the use of power switches in vehicle systems, such as FETs ([0004]). It would have been obvious to one of ordinary skill in the art at the time of the invention to use FETs as the switches in the above invention since FETs are known to be used in the vehicle art, and the other references were silent on this issue.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Art Unit: 2836

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

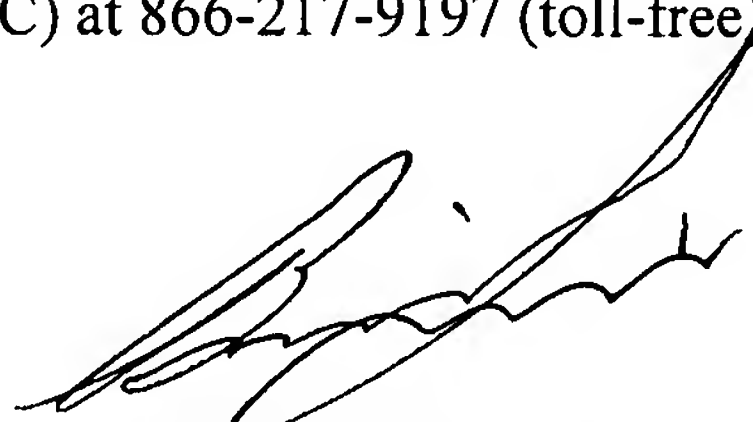
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dru M. Parries whose telephone number is (571) 272-8542. The examiner can normally be reached on M-Th from 9:00am to 6:00pm. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus, can be reached on 571-272-2800 x36. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DMP

10-31-2006



**BRIAN SIRCUS**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**